

ABSTRACT

1 An apparatus (100) for computing the absolute value of a
2 complex number includes separate squaring units (110, 115) for
3 the real and imaginary parts. A square root unit (130)
4 extracts the square root of the sum (120) of these squares,
5 which is absolute value of the complex number. Each squaring
6 unit includes one unsigned multipliers for respective least
7 significant and two signed multipliers for respective most
8 significant bits and a cross term. The products are aligned
9 by shifting and summed. The square root unit employs identical
10 processing elements, each considering two bits of the input
11 and forming one root bit and a remainder. Each processing
12 element compares two intermediate test variables, and selects
13 a "1" or "0" for the root bit and the next remainder based
14 upon this comparison. A chain of processing elements enables
15 computation of the root to the desired precision.
16 Alternatively, the same processing elements may be used in a
17 recirculating manner.